

4.13 Floodwood Plains Management Area

Summary of Use and Management

Vegetative management in the Floodwood Plains management area (MA) (Figure 4.13.1) will provide a variety of forest products; maintain or enhance wildlife habitat; protect areas with unique characteristics; and provide for forest based recreational uses. Timber management objectives for the 10-year planning period include improving managing early successional aspen and pine on appropriate sites; maintaining the conifer component in northern hardwood stands; maintaining the presence of minor cover types on the landscape; and maintaining non-forest vegetation types. Wildlife management objectives include maintaining large non-forest opening complexes found in this area, enhancing the oak component in hardwood stands, Management activities may be constrained by site conditions and the skewed age-class distributions. Balancing age classes will be an issue for this 10-year planning period.

Introduction

The Floodwood Plains management area is on an outwash plain in northwestern Dickinson County. The state forest covers 10,708 acres and is mostly contiguous. State forest lands are the major ownership in this vicinity. The management area is dominated by aspen, lowland conifer and cedar cover types. Other attributes that played a role in the definition of this management area include:

- Dominated by two natural communities: dry-mesic forest and poor conifer swamp;
- Mid-range in site quality;
- Provides multiple benefits including forest products and dispersed recreational activities; and
- Provides a variety of fish and wildlife habitats.

The management priority in this area is to continue to provide these multiple benefits while minimizing user conflicts. Additional priorities include maintaining large non-forest opening complexes found in this area and managing early successional aspen and pine on appropriate sites.

The predominant cover types, composition and projected harvest areas for the Floodwood Plains management area are shown in Table 4.13.1.

Table 4.13.1. Summary of cover types, composition, limiting factor area, manageable area and projected harvest area for the Floodwood Plains management area (2012 Department of Natural Resources inventory data).

Cover Type	Cover %	Current Acreage	Hard Factor Limited Acres	Manageable Acres	10 Year Projected Harvest (Acres)		Projected Acreage in 10 Years	Desired Future Harvest (Acres)	
					Final Harvest	Partial Harvest		Final Harvest	Partial Harvest
Aspen	28%	3,048	58	2,990	512	0	3,048	498	0
Lowland Conifers	21%	2,248	1,144	1104	123	0	2,248	123	0
Cedar	16%	1,705	0	1705	0	0	1,705	107	0
Red Pine	7%	795	49	746	282	48	795	83	442
Northern Hardwood	5%	524	0	524	0	262	524	0	262
Jack Pine	5%	512	0	512	18	0	512	73	0
Upland Open/Semi-Open Lands	3%	323	0	323	0	0	323	0	0
Lowland Open/Semi-Open Lands	5%	578	0	578	0	0	578	0	0
Misc Other (Water, Local, Urban)	0%	0	0	0	0	0	0	0	0
Others	9%	975	413	562	126	8	975	65	31
Total		10,708	1,664	9,044	1,062	318	10,708	949	735

Floodwood Plains

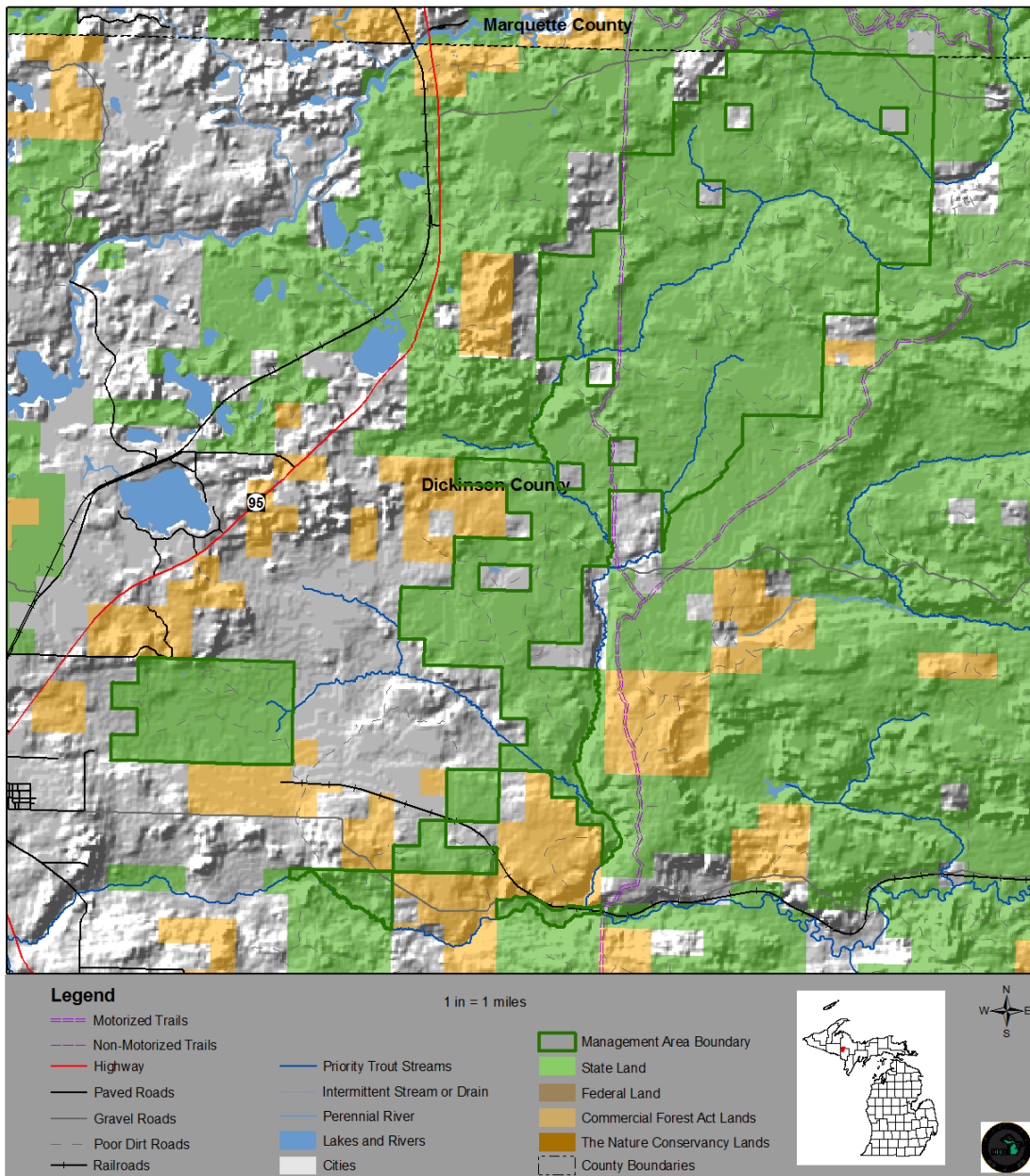


Figure 4.13.1. A map of the Floodwood Plains management area (dark green boundary) in relation to surrounding state forest and other lands in Dickinson County, Michigan.

4.13.1 Forest Cover Type Management Direction

The following sections contain information on vegetation management for each of the major cover types, a grouping of minor cover types and important non-forested vegetation types for the Floodwood Plains management area in the form of Desired Future Condition, 10-Year Management Objectives and Long-Term Management Objectives. This information applies to those portions of the forest where active management (i.e., timber harvest, prescribed fire, planting or mowing) will be conducted. In other portions of the state forest, the natural processes of succession and disturbance will provide ecological benefits. While most stands have a variety of tree species and other vegetation, they are classified by the species with dominant canopy coverage.

The following cover types are valued commercially for their timber products; ecologically as sources of habitat for numerous wildlife species; and for the variety of recreational opportunities they provide. Harvesting and regenerating these cover types will provide for a continuous flow of forest products and will help to ensure (or provide) wildlife habitat.

Aspen Cover Type

Current Condition

The aspen cover type covers 3,048 acres (28%) of state forest land in this management area (Table 4.13.1). Aspen is well represented in the first four age classes, but acreage amounts are noticeably lower in the 40-49 year-old age class. Most stands older than this age class are either factor limited or have a harvest prescribed. Stands that are not harvested are expected to succeed to upland spruce-fir.

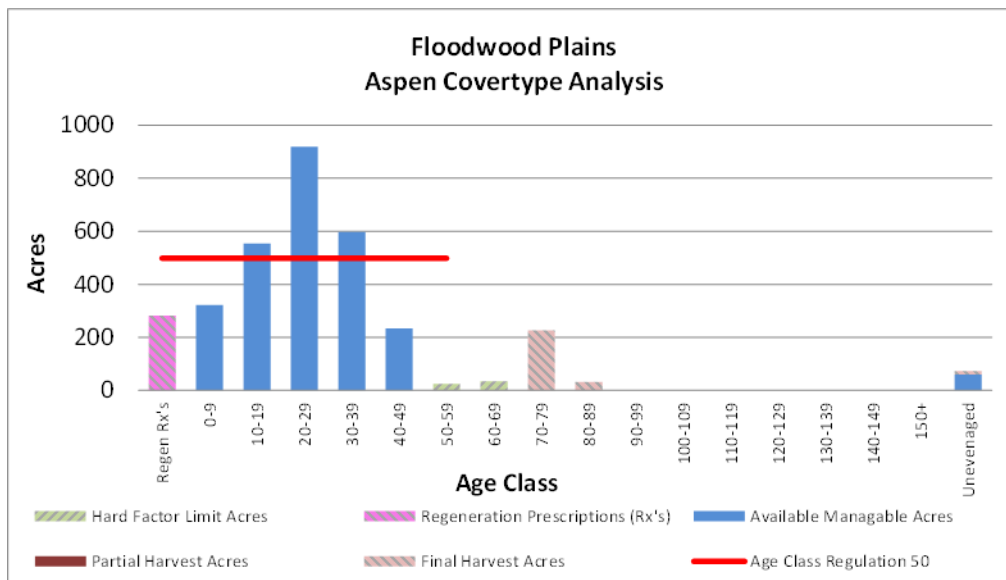


Figure 4.13.2. Graph of the age-class structure for the aspen cover type on the Floodwood Plains management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Balanced acres in each age-class over a 50-year rotation as indicated by the red line in Figure 4.13.2;
- Provide an even supply of forest products;
- Provide a balanced mix of habitat conditions for a variety of wildlife; and
- Provide a variety of hunting-type opportunities.

Long-Term Management Objectives

- Once age classes are more balanced, harvest and regenerate 498 acres each decade; and
- Explore opportunities to harvest in the spikes (above the red line) presently in the 20-29 and 30-39 year-old age classes as these classes grow older and reach merchantable size.

10-Year Management Objectives

- To limit succession to other cover types, harvest stands of 60-90 year old aspen that are in decline;
- Two-aged or uneven-aged stands with mature aspen over younger stands should be identified and scheduled for harvest;
- Identify aspen in some of the younger age classes on higher quality sites that could be harvested early to improve age class;
- Identify low quality off-site aspen stands for conversion to more ecologically appropriate cover types mitigating any aspen acreage loss during this planning period through identification of replacement acreage prior to conversion; and
- Harvest and regenerate 512 acres of aspen during this 10-year planning period.

Lowland Conifers Cover Type

Current Condition

There are 2,248 acres (21%) of this cover type occurring within the management area (Table 4.13.1). These acres occur on poorly drained soils that support mixed stands of cedar, black spruce, tamarack, balsam fir, white birch and balsam poplar. Age classes are poorly distributed with almost all stands in the 80-89 year-old age class and at rotation age. Very little harvesting has occurred as illustrated by the lack of age classes below the 70-79 class. Some of the stands have factor limits due to wet conditions or for riparian corridors. Due to the wet site conditions, they are susceptible to rutting damage from logging equipment and present difficult operating conditions for harvesting. As these stands continue to age they become increasingly susceptible to insect and disease problems.

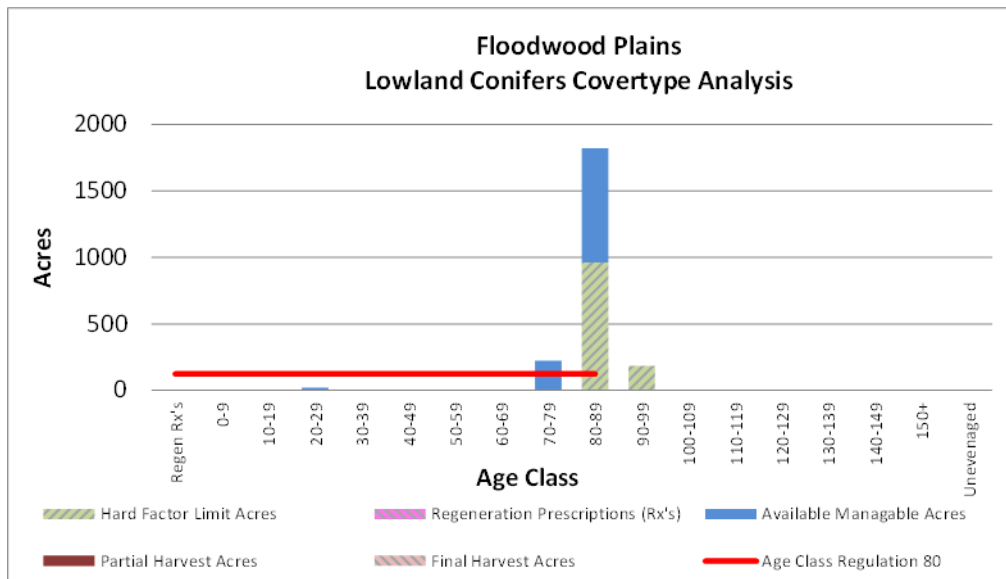


Figure 4.13.3. Graph of the age-class structure for the lowland conifer cover type on the Floodwood Plains management area (2012 Department of Natural Resources inventory data).

Desired Future Condition

- Balanced age classes over an 80-year rotation as represented by the red line in Figure 4.13.3;
- Sustainable regeneration and recruitment of seedlings and saplings;
- Closed canopy stands interspersed with patches of all age classes; and
- Maintain mixed lowland conifer stands with closed canopy structure to provide important winter habitat for deer.

Long-Term Management Objectives

- Once age classes are more balanced, regenerate 123 acres each decade;
- Regenerate stands to a species-mix similar to the pre-harvest conditions with a preference for cedar, hemlock, black spruce and balsam fir; and
- Harvesting will be done using small clearcuts or strips with clumped retention.

10-Year Management Objectives

- Prioritize stands to harvest and regenerate about 123 acres over this 10-year planning period, making use of “low impact” harvesting systems and successful, reliable regeneration techniques.

Cedar Cover Type

Current Condition

The cedar cover type covers 1,705 acres (16%) of the management area (Table 4.13.1). Sites are poorly drained supporting stands of mostly cedar mixed with black spruce, tamarack and balsam fir. Due to the wet site conditions, they are susceptible to rutting damage from logging equipment and present difficult operating conditions for harvesting. Cedar types are poorly distributed across the age spectrum, with all stands being over 80 years of age and in three age classes. Little harvesting has been done in this cover type over the past 80 years and regeneration of cedar stands has been problematic.

Although there will be no harvesting of cedar within deer wintering complexes, there is a need to address future cedar cover. Limited cedar harvests will occur outside the wintering complexes recognizing that cedar takes many years to regenerate and escape deer browsing. Reliable and timely regeneration of cedar is a concern from both wildlife and forest management perspectives.

Desired Future Condition

- Closed canopy stands interspersed with patches of all age classes;
- Sustainable regeneration and recruitment of seedlings and saplings; and
- Maintain cedar cover type on the landscape.

Long-Term Management Objective

- Explore techniques for regenerating the cedar cover type to species mixes similar to the pre-harvest conditions; ideally leading to harvesting 107 acres per decade.

10-Year Management Objective

- While no harvests are planned for this management area in this planning period, limited experimental cedar regeneration and thinning trials may occur, coordinated at the district level.

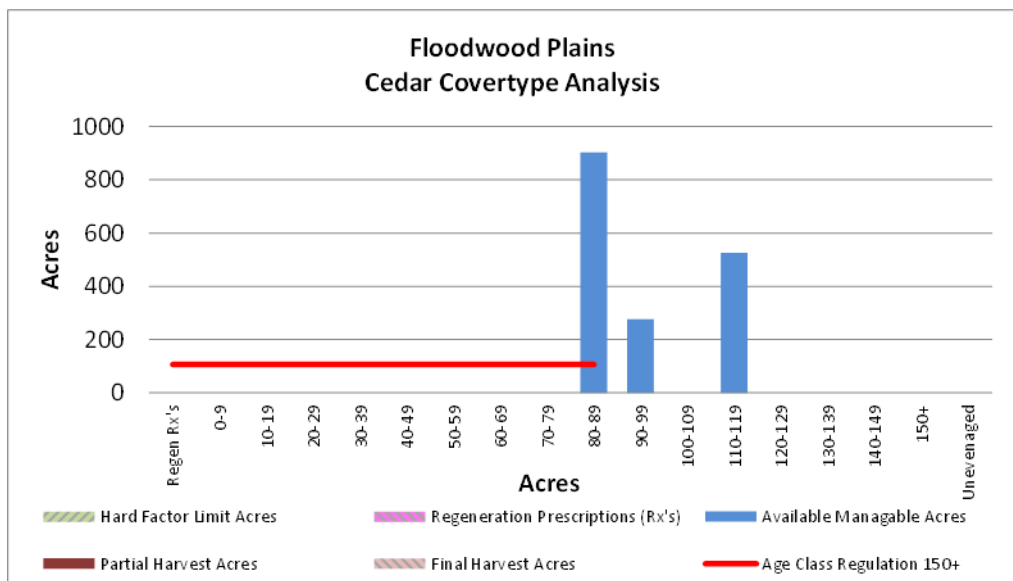


Figure 4.13.4. Graph of the age-class structure for the cedar cover type on the Floodwood Plains management area (2012 Department of Natural Resources inventory data).

Red Pine Cover Type

Current Condition

The red pine cover type covers 795 acres (7%) of the state forest in this management area (Table 4.13.1). Most of the stands are in the 50-59 year old age-class and are scheduled for a partial harvest (primarily thinning). The spike in this

age class is reflective of planting efforts in the 1950s and 60s. Plantation red pine makes up about 60% (477 acres), with natural origin red pine making up the other 40% (318 acres).

Desired Future Condition

- Provide a supply of forest products;
- Maintain the same number of acres of red pine in the management area and at approximately the same ratio of plantation pine to natural origin pine (318 acres natural origin red pine and 477 acres in plantations); and
- Balanced age classes of the plantation red pine to lessen the spike in the 50-59 year old age-class.

Long-Term Management Objectives

- Once age classes are more balanced, harvest and regenerate 83 acres and thin 442 acres each decade;
- Plantation stands will be managed on an 80-year rotation with intermediate harvests (thinning) as basal area guidelines are met; and
- Maintain stands of natural origin on about 40% of the red pine acreage and manage those stands on a 150-year rotation using natural regeneration techniques with scarification as needed.

10-Year Management Objectives

- Thin 282 acres largely from the 50-59 and 80-89 year-old age classes in this planning period which is less than long-term management indicates because of the current age-class imbalance;
- Harvest and regenerate 48 acres of red pine in this planning period; and
- Look for opportunities to restore red and or white pine on appropriate sites.

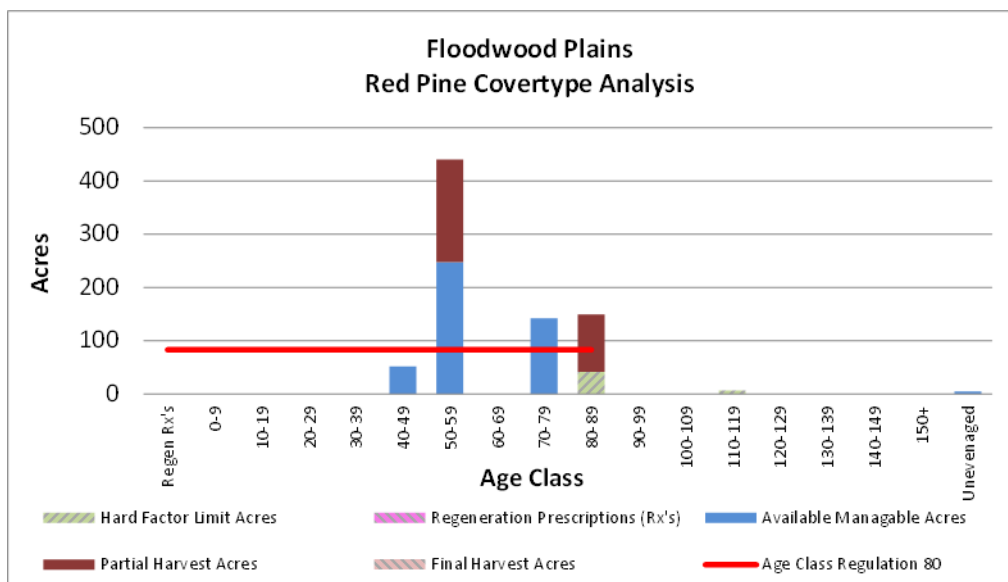


Figure 4.13.5. Graph of the age-class structure for the red pine cover type on the Floodwood Plains management area (2012 Department of Natural Resources inventory data).

Northern Hardwood Cover Type

Current Condition

Northern hardwood stands make up 524 acres (5%) of state forest land in this management area (Table 4.13.1). They occur on good-quality sugar maple sites interspersed with wetland sites. Recruitment of seedlings and saplings into larger size classes is generally not successful due to browse pressure from deer. Northern hardwood is typically managed using an uneven-aged harvest system (selection) based on basal area rather than age. As Figure 4.12.6 indicates, most of the stands have a basal area range of 81-110.

Desired Future Condition

- Uneven-aged northern hardwood stand structure promoting high-value sugar maple sawlogs;
- A full complement of tree seedlings recruiting into the overstory; and
- Well-developed shrub and herbaceous layers.

Long-Term Management Objectives

- Using an uneven-aged system, selectively harvest high-quality northern hardwood stands on a 20-year cycle with an estimated 262 acres harvested each decade; and
- Maintain and encourage minor species to increase within-stand diversity.

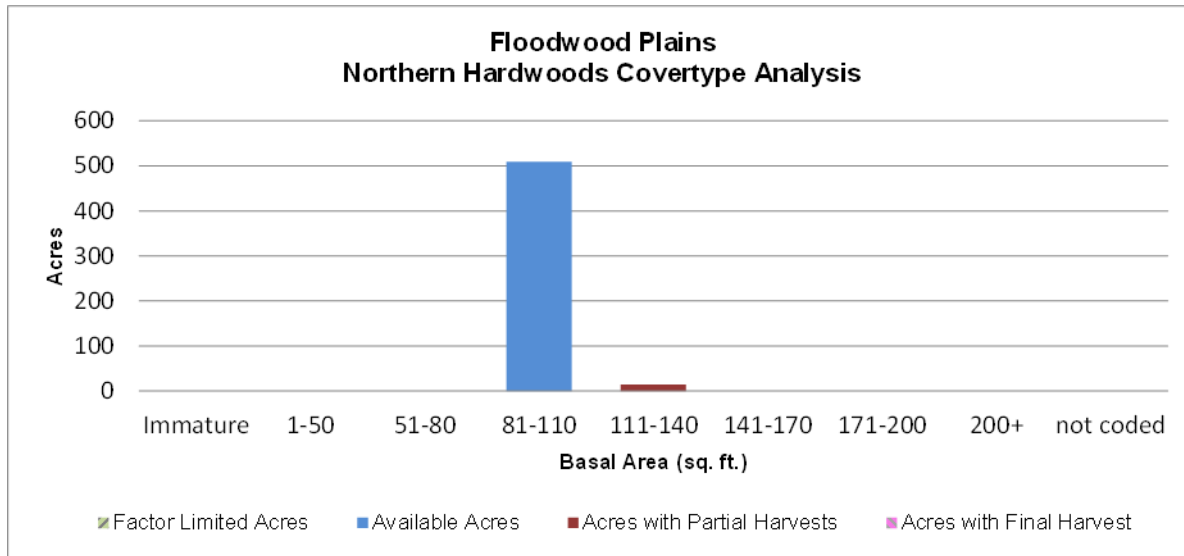


Figure 4.13.6. Graph of the basal area distribution for the northern hardwood cover type on the Floodwood Plains management area (2012 Department of Natural Resources inventory data).

10-Year Management Objectives

- Approximately 262 acres will be select cut in the next decade;
- Maintain and regenerate white pine, oak, hemlock and upland cedar where they occur in stands that are harvested; and
- Work to regenerate hemlock and white pine components in stands lacking that species.

Jack Pine Cover Type

Current Condition

The Jack pine cover type comprises about 512 acres (5%) of the management area (Table 4.13.1). Jack pine generally occurs on sandy soils that tend to be nutrient poor. Most of the jack pine is immature and largely contained in the 10-19 and 20-29 age classes. Very few acres are older than 29 years and all stands 50 years old or older are prescribed for a final harvest.

Desired Future Condition

- Using even-aged management, with a rotation age 60 years, work to balance the age-class structure of jack pine within the management area;
- Provide a supply of forest products;
- Provide a balanced mix of habitat conditions for a variety of wildlife; and
- Provide a variety of hunting-type opportunities.

Long-Term Management Objective

- Once age classes are balanced, harvest and regenerate 73 acres of jack pine every decade.

10-Year Management Objective

- Harvest and regenerate 18 acres over this 10-year planning period.

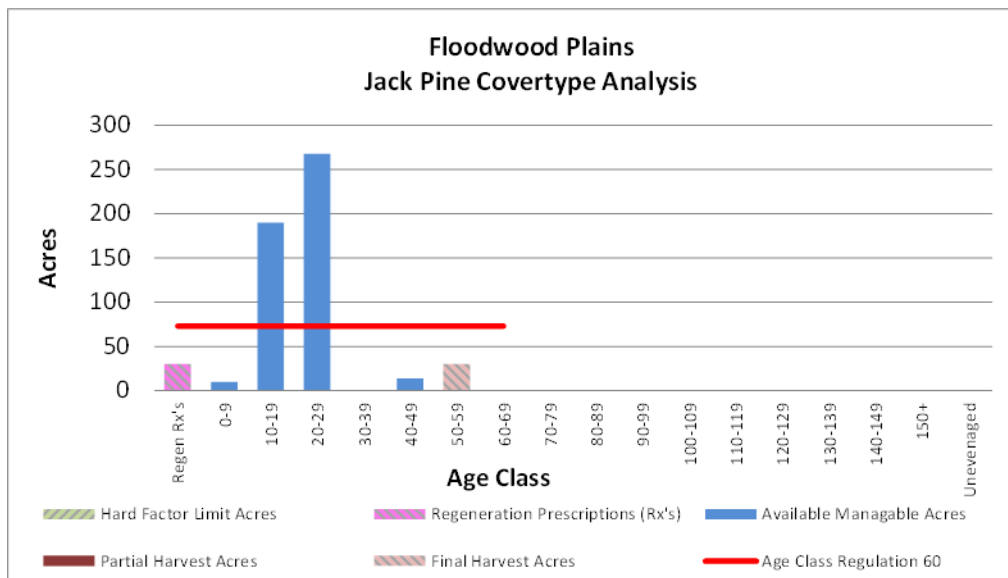


Figure 4.13.7. Graph of the age-class structure for the jack pine cover type on the Floodwood Plains management area (2012 Department of Natural Resources inventory data).

Other Forested Cover Types

Current Condition

Other forested types make up 975 acres and are made up of lowland spruce-fir (319 acres), upland mixed forest (284 acres), upland conifers (157 acres), upland spruce-fir (104 acres), tamarack (60 acres), oak (23 acres), white pine (18 acres), lowland poplar (five acres) and mixed upland deciduous (five acres). Together these types make up about nine percent of the management area. Of these cover types, 42 percent have a hard factor limitation (Table 4.13.1).

Desired Future Condition

- Maintain the presence of the minor cover types within the management area.

Long-Term Management Objectives

- Manage minor cover types to maintain representation using appropriate silvicultural methods;
- Featured species habitat requirements will be taken in to consideration; and
- As individual age-class distributions for these species approach balance, about 159 acres will be final harvested and 8 acres partially harvested every decade.

10-Year Management Objectives

- Harvest those stands without harvest limitations adjacent to other planned harvest activities and where stand and habitat conditions indicate that harvesting is appropriate; and
- Expected harvests in these types will be less than 134 acres over this 10-year planning period which is higher than long-term management would indicate and is due to the current age-class imbalances within the individual cover types.

Other Non-forested Cover Types

Current Condition

The following non-forested cover types are found on this management area: upland open/semi- open lands (323 acres-3%), lowland open/semi-open lands (578 acres – 5%) and other (water, local, urban) (No acres).

Desired Future Condition

- These areas will be maintained in the current condition.

Long-Term Management Objective

- Grass stands (upland open/semi-open cover types) will be burned or mowed to prevent forest encroachment.

10-Year Management Objective

- Grass-types (upland open/semi-open cover types) will be treated for opening maintenance as needed.

4.13.2 – Featured Wildlife Species Management

The Floodwood Plains management area is dominated by sandy soils and poorer quality timber, with the exception of some good quality oak. The oak should be encouraged and expanded, where possible. A large percentage of the management area has been maintained as “open” for decades. A sharp-tail grouse population once existed here, but only occasional birds have been seen in recent times. Sandhill cranes and Canada geese use the area and open fields that were maintained in the past. These openings should be maintained and fire is an ideal tool for the job as it also stimulates blueberry. The primary focus of wildlife habitat management in the Floodwood Plains management area will be to address the habitat requirements for the following featured species: American woodcock, black bear, ruffed grouse, upland sandpiper and white-tailed deer. Based on the selected featured species, some of the most significant wildlife management issues in the management area are early successional forest conditions (associated with alder, riparian zones or forested wetlands); mast (hard and soft); large open land complexes; and deer wintering complexes. During this 10-year planning period, additional analyses to better define the spatial extent of priority areas for featured species will be performed.

American Woodcock

The western Upper Peninsula goal for woodcock is to maintain or increase woodcock habitat. In priority areas, management should focus on maintaining early successional habitat associated with riparian zones and forested lowlands.

Wildlife habitat specifications:

- Maintain aspen cover type within the management area where associated with alder, riparian zones or forested wetlands;
- Balance aspen age-class distribution within the management area;
- Use silvicultural practices that encourage the aspen component in mixed stands associated with alder, riparian zones or forested wetlands; and
- Maintain or create rough openings associated with alder, riparian zones, regenerating aspen or forested wetlands within the management area.

Black Bear

The western Upper Peninsula black bear goal is to increase abundance. Management for bear should focus on improving existing habitat (e.g., maintaining corridors, mast and refuge trees) in this management area.

Wildlife habitat specifications:

- Maintain or increase the oak cover type and within stand oak component of hardwood forests within the management area;
- Maintain or increase mast by providing forest clearings that promote food sources such as pin cherry, juneberry/serviceberry, hazel, raspberry, blackberry and blueberry;

- Minimize herbicide use that would be detrimental to mast production;
- Maintain lowland conifer and hardwoods along and around drainages, vernal pools and forested wetlands; and
- Maintain refuge tree species with rough bark for cubs to escape (e.g., white pine and hemlock).

Ruffed Grouse

The western Upper Peninsula goal for ruffed grouse is to maintain or improve habitat. Management during this planning period will focus on early successional forest in priority landscapes, balancing age-class distribution and provision of soft browse.

Wildlife habitat specifications:

- Maintain aspen acres in the management area and balance the age-class distribution of aspen cover types.
- Stand size for grouse: Ideal aspen stands will be irregularly shaped 10-40 acres to maximize juxtaposition or edge avoiding extensive single age final harvests. Larger harvest units should have irregular boundaries, provide one 1-3 acre unharvested clumped inclusion for every 40 acres harvested.
- Hold or increase the conifer component in aspen stands. Leave conifers under four-inch diameter at breast height in mixed stands and aspen types as immediate residual escape cover and to promote corridors.
- Maintain cherry production for soft mast and oak component in stands with oak and emphasize areas with a hazel understory.

Upland Sandpiper

The western Upper Peninsula goal is to provide suitable breeding habitat for upland sandpiper in select appropriate WUP management areas. State forest management during this planning period will focus on maintaining large opening complexes and using the compartment review process to schedule jack-pine harvests associated with permanent openings on a sustainable rotation and schedule harvests adjacent to burns or schedule similarly-aged jack pine treatments in close proximity to each other.

Wildlife habitat specifications:

- Maintain opening complexes of 250 acres or larger.
- Open blocks within complexes should be within one mile of each other.
- Where possible, strive to consolidate patches into larger opening complexes, by creating temporary openings associated with permanent openings. This could be accomplished by scheduling jack pine clear-cuts associated with permanent openings on a sustainable rotation, scheduling harvests adjacent to burns or schedule similarly aged jack-pine treatments in close proximity to each other.
- Work with adjacent landowners within the management area to maximize the amount and distribution of open land habitat.
- Mow or burn patches every 3-5 years to eliminate woody vegetation succession as the budget allows.

White-tailed Deer

The western Upper Peninsula goals for white-tailed deer are to: 1) Maintain existing deer wintering complexes and 2) Expand the extent of areas suitable as winter deer habitat, especially in the medium and high snowfall zones. Management should focus on maintaining habitat quality in priority wintering complexes. DNR department procedure 32.22-07 states "Coniferous swamps are important as winter deeryards and shall be managed primarily for deer. The objective shall be to maintain them for this purpose and through commercial cuttings and silvicultural practices, improve these areas to provide winter cover and food for deer." There is a complex relationship between deer abundance; available summer and winter habitat; timber management; and regeneration tree species, particularly white cedar and hemlock. It is recognized that meeting both timber management and deer goals presents challenges for the department and our stakeholders. Information on deer wintering complexes is currently being updated and new management guidelines are being developed. When completed, these will provide additional direction for managing these critical areas for white-tailed deer.

Wildlife habitat specifications for deer wintering complexes:

- Strive to maintain > 50% of the land area within deer wintering complexes in mixed or pure stands of cedar, hemlock, white and black spruce, white and natural red pine, balsam fir, mixed swamp conifer and mixed upland conifer-hardwood.
- In northern white cedar and hemlock cover types that are commonly occupied by deer during severe winters, especially in medium and high snowfall zones, maintain canopy closure of >65%.
- In deer wintering complexes in low snowfall areas, and within ¼-mile of severe-winter cover in the higher snowfall zones, write prescriptions that strive to maintain canopy closure of 40-65%, favoring cedar, hemlock, white spruce, black spruce, balsam fir and white pine.
- Provide winter forage in deer wintering complexes through stands of regenerating hardwood or brush, including preferred species of red maple, sugar maple, aspen, yellow birch, ashes, oaks, dogwood, crabapple, elderberry, high-bush cranberry, sumac and hazel.
- Enhance accessibility to winter browse within deer wintering complexes by maintaining mature mesic conifer components within upland hardwood stands or by maintaining or enhancing sheltered travel corridors between areas of conifer cover and browse.
- Provide spring break out areas by maintaining open hardwood stands on southern exposures and herbaceous openings adjacent to deer wintering complexes.
- When possible, timber harvests within deer wintering complexes should be carried out only during winter months and tops should be left. Chipping of non-bole wood and whole-tree harvesting in the deer wintering complexes should be avoided, but will be discussed on a case-by-case basis through the compartment review process.
- Harvests of cedar and hemlock may only be conducted when:
 - There is reasonable confidence of successful recruitment/regeneration of the cover types; or
 - There is a forest health issue (e.g., hemlock wooly adelgid); or
 - Part of an approved research project; or
 - Removal of selected trees will facilitate a reduction of harvest trails, landings, etc. to minimize soil sedimentation and possible soil compaction issues.
- Provide fall foods in the form of hard and soft mast, and provide dense escape cover or bedding areas in the form of early successional forests, brush and warm-season grasses that will encourage fall deer use in areas open to public hunting. Where habitat types are appropriate, increase diversity of hard mast by planting oak.

4.13.3 – Rare Species and Special Resource Area Management

All forest operations must be reviewed for potential conflicts between rare species and proposed forest operations following the guidance in “DNR’s Approach to the Protection of Rare Species on State Forest Lands” (IC4172). This is especially important when listed species are present, when past surveys have indicated a possibility of their presence, or when appropriate habitat is available and the species is known to occur in the general region.

Past surveys have noted and confirmed no listed species or natural communities of note occurring in the management area. Any established management guidelines will be followed. Further surveys for special species and natural communities will be carried out as a matter of course during the inventory process and opportunistically for special more focused surveys.

There are no high conservation value areas or ecological reference areas identified in this management area as illustrated in Figure 4.13.8.

Management goals during this planning period:

Goal 1: To develop and maintain a list of rare, threatened, endangered and special concern species and natural communities for the management area through a continuous inventory and through opportunistic focused inventory surveys.

Objective 1-1: Field staff should be trained and aware of the identification characteristics and natural history of rare, threatened, endangered and special concern species.

Objective 1-2: Occurrences of rare, threatened, endangered and special concern species noted during the inventory process by inventory staff should be verified and added to the body of knowledge for the management area.

4.13.4 – Forest Health Management

Although forest health issues span the entire landscape, some specific threats are more important in this management area due to the species composition, site quality or other factors. Some of the more important forest health pests in this area include white trunk rot of aspen, *Hypoxylon* canker and spruce budworm.

When forest pests are detected, they are to be reported to the forest health specialist for treatment recommendations. The treatment of large outbreaks of forest pests will be coordinated on a state and regional level.

Several invasive exotic species of plants are thought to be located in the vicinity. When invasive species are detected, they will be reported to the forest health specialist and treatment options will be reviewed. Priority for treatment should be given to those species that threaten sensitive sites due to their location or growth characteristics and have population levels that may be successfully controlled. The only species of concern that been documented in or near this management area is Japanese knotweed.

Floodwood Plains

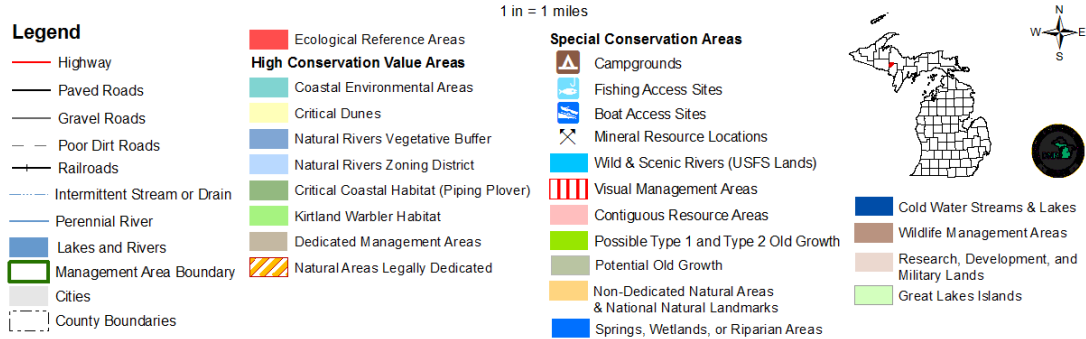
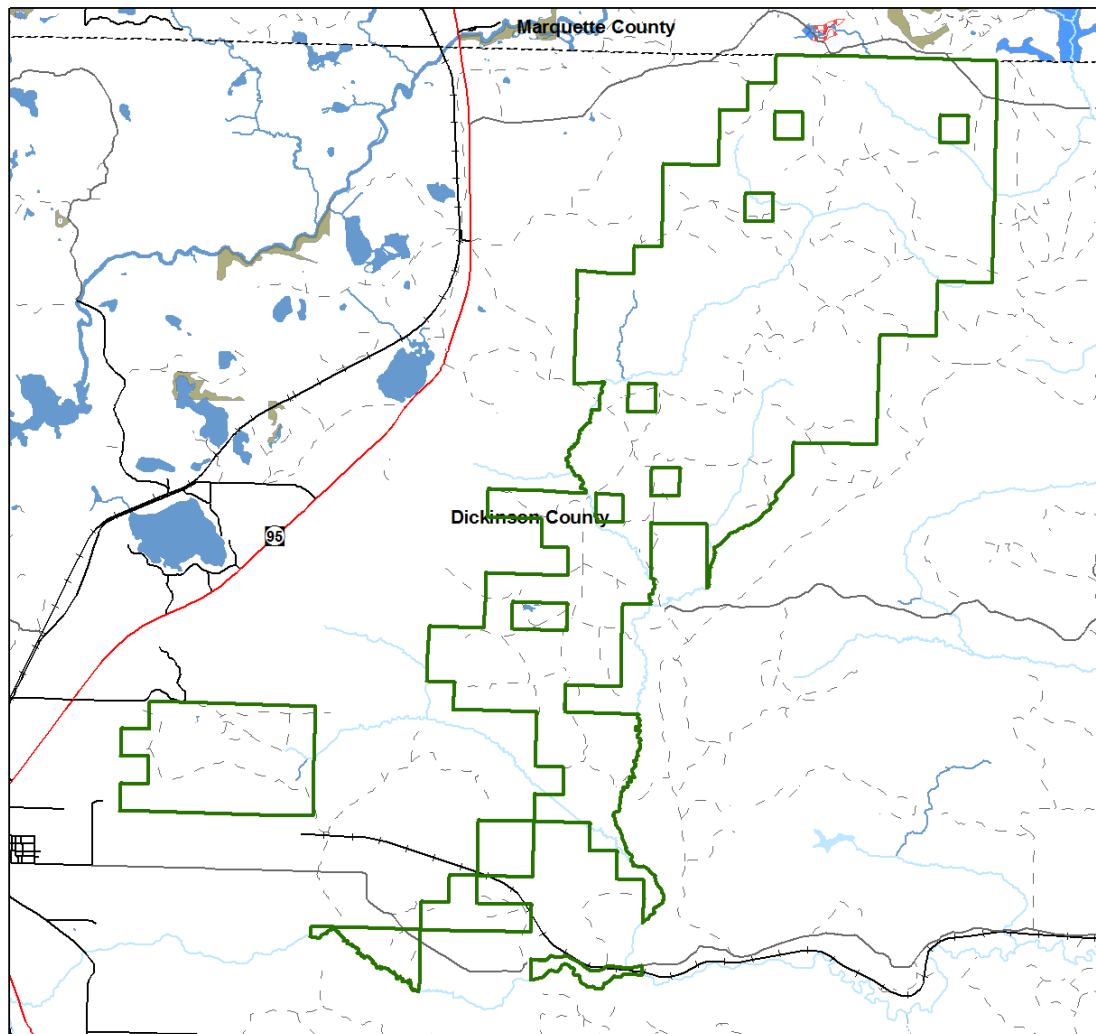


Figure 4.13.8. A map of the Floodwood Plains management area showing the special resource areas.

4.13.5 – Aquatic Resource Management

Fisheries Division management unit biologists will review proposed forest management activities using the compartment review process and will consider the potential impact of proposed prescriptions upon riparian and aquatic values. Management prescriptions will be modified to account for riparian and aquatic values by applying the standards and guidance documents listed in the introduction to this plan section to the unique conditions specific to any given forest stand.

Prescription of riparian management zone widths greater than the minimum widths provided in IC4011 (*Sustainable Soil and Water Quality Practices on Forest Land*) must be justified and documented during the compartment review process.

Forested stands adjacent to designated high priority trout streams will specifically be managed to discourage beaver use in accordance with both DNR Policy and Procedure 39.21-20 Beaver Management and IC 4011. Designated high priority trout streams are identified in the Integrated Forest Monitoring Assessment and Prescription Geographic Decision Support Environment. Remove or discourage beaver populations on designated high priority trout streams.

High priority trout streams in this management area are shown in Figure 4.13.1.

4.13.6 – Fire Management

Under natural fire regimes, much of the uplands probably were subject to regular, periodic stand replacement burns, maintaining open dry and dry-mesic northern forest communities. Associated lowlands probably limited overall size of any individual fire.

- All wildfires are subject to appropriate initial attack response.
- The Floodwood Zone Dispatch area provides plans for initial attack, based on fire danger level. It calls for elevated readiness and aggressive response to reported wildfires during periods of VERY HIGH and EXTREME fire danger.
- Due to the high-risk fuels in the management area, private landowners should be encouraged to undertake Firewise practices to protect their properties from possible fires.
- The core barrens community within the management area has no record of being burned, though some areas remain relatively open and may be suitable for large opening management.

4.13.7 – Public Access and Recreation

This area has good public and management access. Two snowmobile trails cross through this area as shown in Figure 4.13.1.

- Maintain current management and public access.

4.13.8 – Oil, Gas and Mineral Resources

Exploration and development for oil and gas has been limited to a few wells drilled in the eastern Upper Peninsula and no economic oil and gas production has been found anywhere in the Upper Peninsula.

Surface sediments consist of medium-textured till, peat and muck and glacial outwash sand and gravel and postglacial alluvium. The glacial drift thickness varies between 10 and 100 feet. Sand and gravel pits are located in the area of the management area and there could be potential on the uplands.

The Precambrian Michigamme Formation and Archean Granite/Gneiss subcrop below the glacial drift. The Granite/Gneiss sometimes can be used as dimension stone.

Metallic mineral exploration has occurred in the management area in the past. There are a couple Metallic Mineral leases in the northern end of the management area, and metallic mineral potential appears to be possible in the future.